# Executive Summary

## Introduction

Cascades Diversion Dam is a timber crib dam constructed in 1917 to divert the flow of the main stem of the Merced Wild and Scenic River into a hydroelectric generating facility (see photo). The hydroelectric facility was taken off line in 1985 and 1986 because it was deteriorated and outdated. Turbines and other equipment were removed from the powerhouse, and the majority of the penstock was removed. Some elements of the former hydroelectric generating facility still remain, including abutments that flank the dam, an intake structure, a screenhouse, 300 feet of concrete penstock (which historically conveyed water from the dam to the powerhouse), the powerhouse, and the transmission lines. Cascades Diversion Dam impedes flow of the Merced Wild and Scenic River in this area. In addition, Cascades Diversion Dam is classified as a high-hazard structure (USBR 1997). It is in unsatisfactory condition due to flood damage sustained in 1997 and to continuing deterioration associated with age. Due to the threat to public health and safety and to natural resources in the Merced Wild and Scenic River corridor, the dam needs to be removed before further deterioration or total dam failure occurs.

*Cascades Diversion Dam and intake structure on the Merced River.*

Cascades Diversion Dam and intake structure with screens were determined to be eligible for nomination to the National Register of Historic Places in 1982 (NPS 1982). The National Park Service has completed all cultural resource compliance procedures required under the National Historic Preservation Act for removal of the dam and associated features (NPS 1987b). Refer to Chapter VI, Consultation and Coordination, for a history of environmental compliance related to Cascades Diversion Dam.

The National Park Service solicited public input on the proposed project by holding a public scoping meeting, accepting public scoping comments, publishing fact sheets and planning updates, and through ongoing open house meetings. Based on federal law, regulations, and executive orders, and public scoping comments, the National Park Service determined that an environmental assessment (not an environmental impact statement) would be the appropriate level of compliance for the Cascades Diversion Dam Removal Project. Public scoping comments

and issues raised by National Park Service staff were used in the alternatives development process and the analysis presented in this document. As lead agency for the National Environmental Policy Act process, the National Park Service is responsible for preparation of this environmental assessment.

## Purpose Of and Need For the Project

The purpose of the Cascades Diversion Dam Removal Project is to remove an unnatural obstruction on the Merced River and to restore the river's natural free-flowing condition. This removal project is consistent with the Wild and Scenic River guidance provided in the *Merced Wild and Scenic River Comprehensive Management Plan* (Merced River Plan) (2001a) and will meet the direction of the *Yosemite Valley Plan* (NPS 2000a), which calls for the dam's removal.

Cascades Diversion Dam is classified as a high-hazard structure (USBR 1997). It is in unsatisfactory condition due to flood damage sustained in 1997 and to continuing deterioration associated with age. In addition, the dam no longer serves a useful purpose – water is not diverted from the site to generate electricity or for other uses, and the impoundment does not regulate high water. Removal of the existing dam structure is necessary to prevent possible uncontrolled and sudden failure, which could result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Such an occurrence could pose a considerable threat to valued resources (such as aquatic life, scenic vistas, and recreational opportunities), infrastructure (El Portal Road, wastewater, telephone, and electrical lines), and human life.

In addition, the National Park Service is entrusted with conserving and restoring park values. This responsibility includes protecting the biological and physical processes that created the park, along with scenic features, natural landscapes, and native plants and wildlife. The removal of the dam would work toward fulfilling this mandate by restoring this segment of the Merced River.

## Relationship to Other Plans

The Yosemite National Park 1980 *General Management Plan,* Merced River Plan, and *Yosemite Valley Plan* are the guiding documents for the Cascades Diversion Dam Removal Project, which is located within the Wild and Scenic River boundaries of the Merced River. The *General Management Plan* is the overall guiding document for planning in Yosemite National Park. The Merced River Plan is a programmatic plan that derives its authority from the Wild and Scenic Rivers Act. In designating the Merced River as a Wild and Scenic River, Congress authorized the National Park Service to prepare a management plan for the river by making appropriate revision to the park's *General Management Plan* (16 United States Code 1274[a][62]). The Cascades Diversion Dam Removal Project complies with conditions outlined in the Merced River Plan. The *Yosemite Valley Plan* is an implementation plan that presents a comprehensive management plan for Yosemite Valley. The Cascades Diversion Dam Removal Project would implement an action called for in the *Yosemite Valley Plan*. Specific actions proposed by this project are consistent with guidance set forth by the *General Management Plan,* the Merced River Plan, and the *Yosemite Valley Plan*.

## Overview of the Alternatives

The Cascades Diversion Dam Removal Project Environmental Assessment presents and analyzes three sets of proposals, referred to as the alternatives. The No Action Alternative represents management direction and conditions as they currently exist for Cascades Diversion Dam. The two action alternatives represent a reasonable range of options to satisfy the purpose of and need for the project, while also meeting all relevant legal requirements. Each of the action alternatives aims to achieve the goals of this project, but varies in its proposal for Cascades Diversion Dam.

The National Park Service has identified Alternative 2, Complete Dam Removal, as the preferred alternative. It protects resources, meets the direction of the *Yosemite Valley Plan*, complies with the goals of the *General Management Plan* and Merced River Plan, and reflects the spirit of the Wild and Scenic Rivers Act. Meeting these needs complies with the National Park Service Organic Act and Yosemite National Park enabling legislation. The selection of a final alternative will be documented in a Finding of No Significant Impact.

### *Alternative 1: No Action*

The No Action Alternative maintains the status quo at Cascades Diversion Dam, as described in Chapter III, Affected Environment. It provides a baseline from which to compare the action alternatives, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes.

Under the No Action Alternative, Cascades Diversion Dam would continue to degrade and would eventually fail. Dam failure would likely occur during high-flow conditions, releasing large debris and sediments to the river and banks. In addition, continued deterioration of the dam over time would result in the release of large debris. Dam debris could damage downstream natural, cultural, and scenic resources as well as recreation opportunities and park facilities. Dam debris could also result in serious injury and/or fatality to recreational users of the river. There are voids under the existing timber crib sheathing, and many boards are on the verge of collapse. People walking on the dam's wooden crest and the exposed riverbanks and rocks in close proximity to the dam could be exposed to hazards, such as falling from the dam structure. The National Park Service would remove dam debris from the river as soon as possible following release, although debris retrieval would not likely commence until low-flow conditions, which could be several months after dam failure or debris release. Diverted riverflows and erosion could result in adverse impacts to vegetation, soils, and cultural resources along the riverbanks. Over the long term, uncontrolled dam failure would restore free flow of the Merced River at this location.

### *Alternative 2: Complete Dam Removal*

Alternative 2 includes complete removal of the dam, the dam abutments, the intake structure, and the screenhouse, and restoration of the related river channel located beneath the dam site. Approximately 4,400 to 5,400 cubic yards of sediments (including rock and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover over time, as sediments are transported from the impoundment area. However, the rate of natural

channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the river-right abutment, intake structure, and screenhouse, the river-right bank would be stabilized using a bioengineered bank stabilization system (brush layering incorporated into a boulder structure) to prevent erosion. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

### *Alternative 3: Partial Dam Removal*

Alternative 3 includes complete removal of the dam, the river-left dam abutment, and the screenhouse on the river-right intake structure, and restoration of the related river channel located beneath the dam site. Under this alternative the river-right dam abutment and intake structure would be retained for use as a river viewing platform. Approximately 4,400 to 5,400 cubic yards of sediments (including rocks and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time, as sediments are transported from the impoundment area. However, the rate of natural channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the dam and screenhouse, the river-right bank would be stabilized upstream and downstream of the intake structure using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

## Environmentally Preferable Alternative

The Council on Environmental Quality Regulations implementing the National Environmental Policy Act and the National Park Service National Environmental Policy Act guidelines require that "the alternative or alternatives which were considered to be environmentally preferable" be identified (Council on Environmental Quality Regulations, Section 1505.2). Environmentally preferable is defined as "the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources" (Council on Environmental Quality 1981).

Section 101 of the National Environmental Policy Act states that "… it is the continuing responsibility of the Federal Government to … (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports

diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources." The environmentally preferable alternative for the Cascades Diversion Dam Removal Project is based on these national environmental policy goals.

### *Alternative 1: No Action*

The No Action Alternative represents conditions and management practices as they currently exist for Cascades Diversion Dam. The provision of safe, healthful, productive, and aesthetically and culturally pleasing surroundings (provision 2 of the national environmental policy goals) would be adversely affected due to continued deterioration and uncontrolled dam failure, which would result in visually intrusive bank erosion and debris within the channel of the Merced River, endanger the downstream aesthetic and cultural resources in the vicinity, and result in short-term air quality, noise, transportation, and orientation and interpretation impacts. However, Alternative 1 would partially fulfill provision 2 by continuing to provide a carpool/recreation access point in the project vicinity. Alternative 1 would not fulfill provision 3 of the national environmental policy goals, because risks to public health and safety would worsen under this alternative (due to the uncontrolled failure of the dam and continued safety hazards associated with falling from the dam structure) and because recreation resources could be impacted by dam failure and debris retrieval activities. Alternative 1 would not preserve natural resources as required under provision 4 of the national environmental policy goals. Eventual dam failure would lead to sudden bank erosion that would affect soils, water quality, biological resources such as vegetation and special-status species, and cultural resources downstream from the dam. Under Alternative 1, the dam (a contributing element to the Yosemite Hydroelectric Power Plant) would no longer exist.

### *Alternative 2: Complete Dam Removal*

Alternative 2 includes the complete removal of the diversion dam and attendant structures in addition to site restoration. Because dam removal would occur in a controlled manner (e.g., within a delineated work area, during low-flow conditions, with the application of best management practices), Alternative 2 would avoid the more pronounced adverse effects of uncontrolled dam failure and debris retrieval activities described under Alternative 1. The application of mitigation measures described in Chapter II would further reduce the potential adverse impacts. Site restoration and bank stabilization under this alternative would aesthetically improve the project area surroundings (provision 2 of the national environmental policy goals). Alternative 2 would fulfill provision 3 of the national environmental policy goals by reducing risks to public health and safety through the controlled removal of the dam and application of mitigation measures to reduce hazards to visitors. Alternative 2 would also retain the parking lot to the north of the dam, but would remove health and safety impacts to recreation users (conflict with vehicles) associated with use of the dam area for sightseeing and other activities. Alternative 2 would preserve natural and downstream cultural resources as required under provision 4 of the national environmental policy goals. This alternative would implement measures to reduce adverse effects related to dam removal activities (e.g., best management practices) and includes site restoration and bank stabilization to increase site stability and biological integrity. Alternative 2 would also ensure protection of sensitive cultural resources in the project vicinity by avoiding the adverse effects of downstream bank erosion that would occur under Alternative 1.

As with Alternative 1, the dam (a contributing element to the Yosemite Hydroelectric Power Plant) would no longer exist under Alternative 2.

### *Alternative 3: Partial Dam Removal*

From an environmental perspective, Alternative 3 differs from Alternative 2 primarily in its retention of the river-right dam abutment and intake structure as a river-viewing platform. Alternative 3 would be less sensitive than Alternative 2 to provisions 2, 3, and 4 of Section 101 of the National Environmental Policy Act, as stated above, because free flow would remain affected in the immediate area of the structure; therefore, Alternative 3 would not enhance the integrity of wetland and aquatic resources in the area to the same degree as Alternative 2. The health and safety of park visitors would not be protected to the same degree as under Alternative 2, due to continued vehicle safety hazards. Further, the river-viewing platform (and visitors using the platform) would be exposed to long-term geologic hazards. Removal of the parking area to the north of the dam would eliminate a carpool/recreation access point in the project vicinity. As with Alternative 1, the dam (a contributing element to the Yosemite Hydroelectric Power Plant) would no longer exist under Alternative 3.

### *Environmentally Preferable Alternative*

The environmentally preferable alternative is Alternative 2 because, among the alternatives considered in detail, it most fully satisfies the national environmental policy goals stated in Section 101 of the National Environmental Policy Act. Alternative 2 would (1) provide a high level of protection of natural and downstream cultural resources while concurrently attaining the widest range of beneficial uses of the environment without degradation; (2) reduce risks to public health and safety; and (3) provide aesthetically pleasing surroundings.